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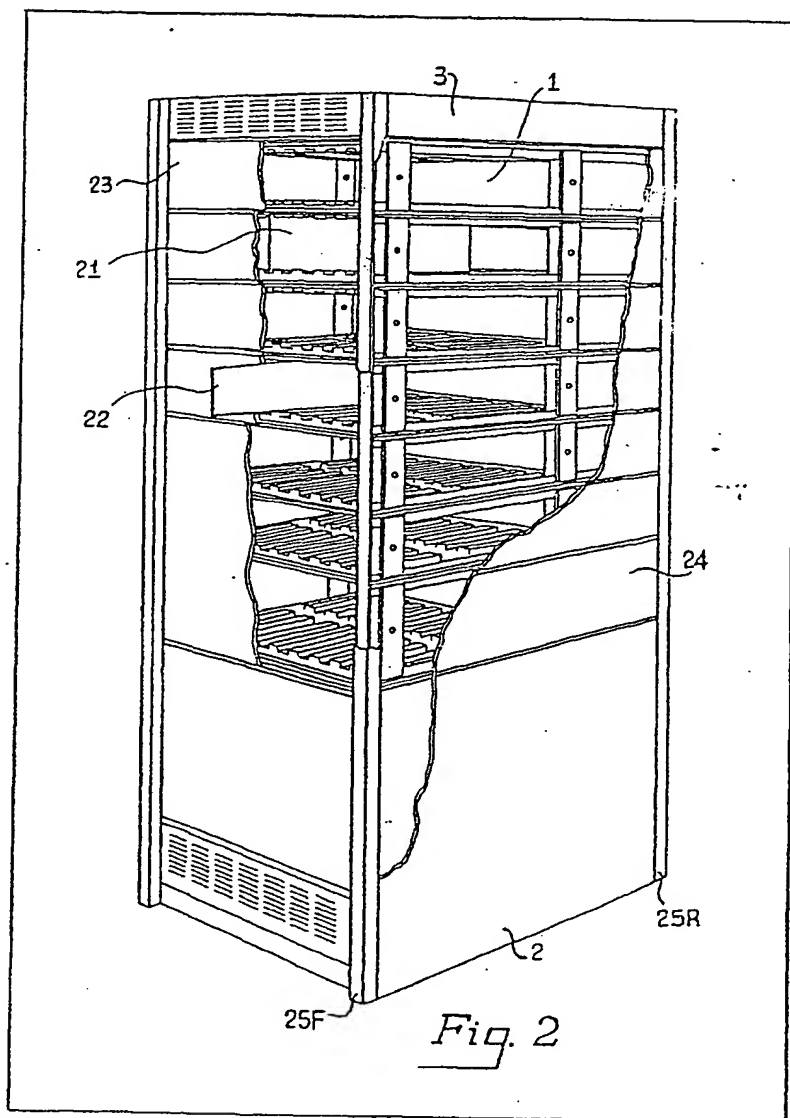
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## (54) Printed circuit board rack

(57) The rack is made up of small  
single modules 1, comprising printed  
circuit cards (21, 22) mounted in a  
frame, adapted to co-operate with  
other modules to form a multi-module  
rack. Each rack consists of a base unit

2, housing a blower, power supply unit  
and mains distribution system etc.,  
one or more single modules 1 stacked  
upon each other and on the base unit,  
and a cabinet top 3 providing a  
ventilation exit.

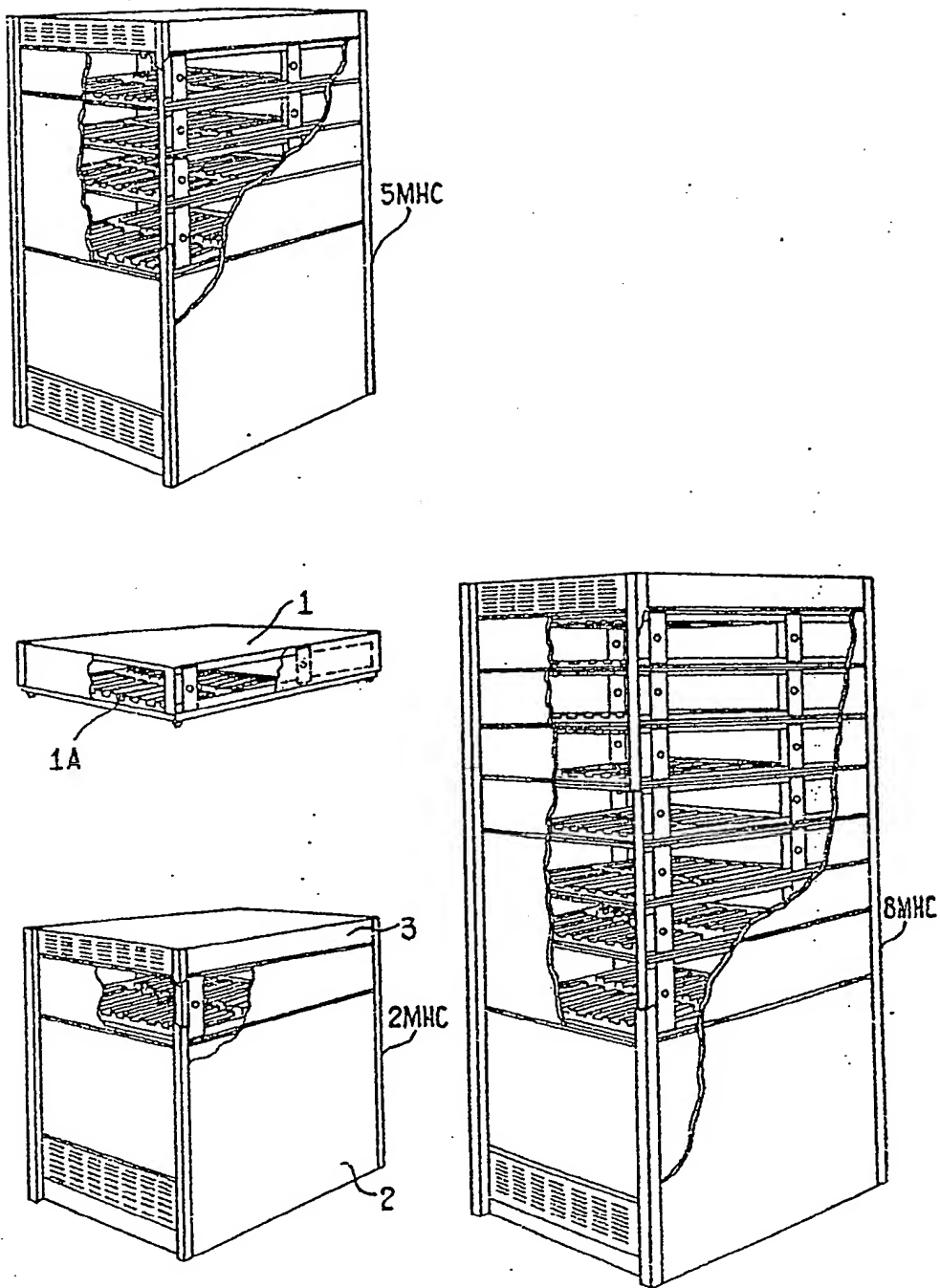
The modules are adapted to  
interlock and the rack is completed  
with the incorporation of side panels.



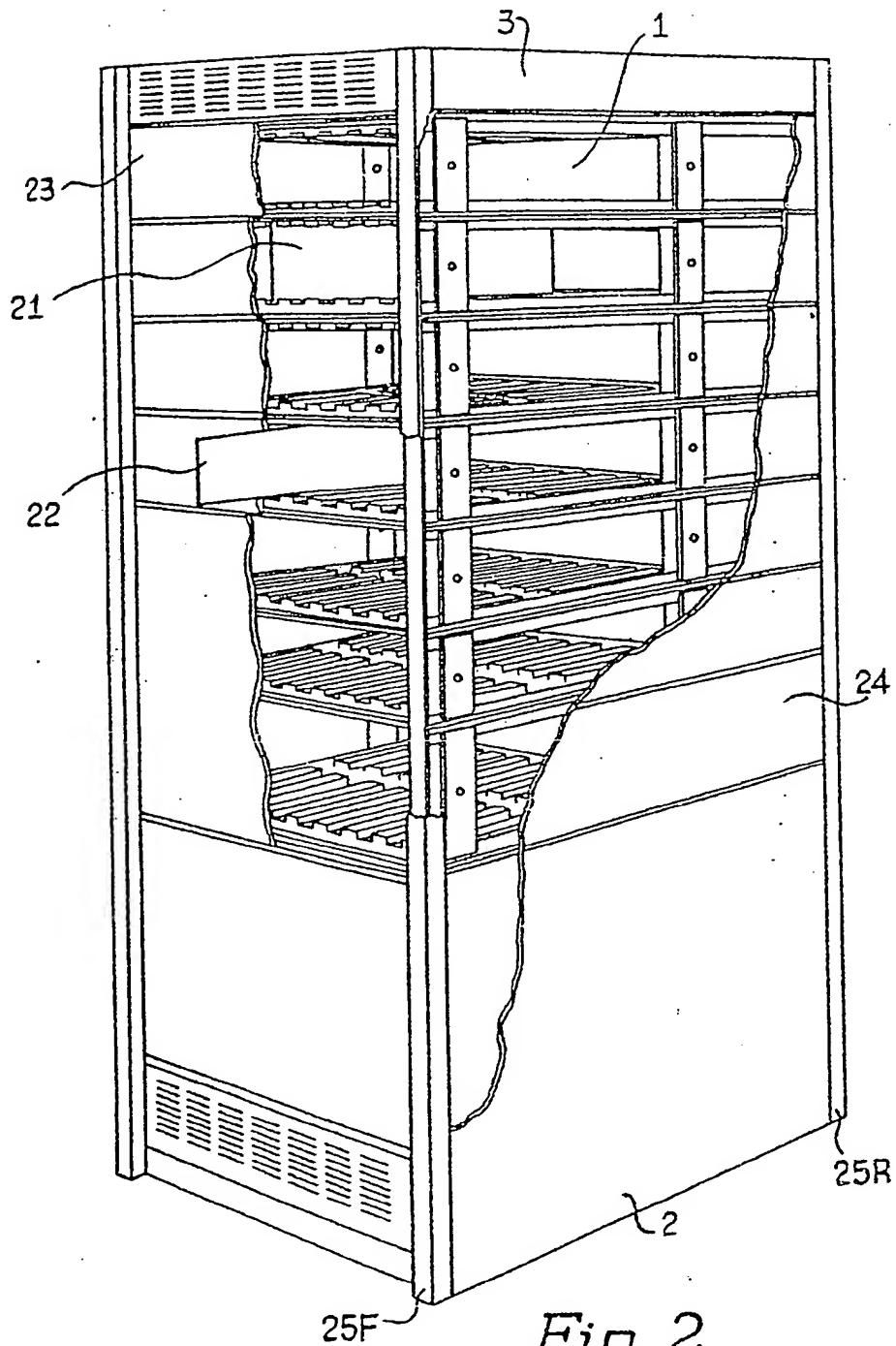
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The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

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Fig. 1

2/2



## SPECIFICATION

## Electrical equipment rack construction

The present invention relates to electrical equipment rack constructions and is more particularly concerned with the provision of a flexible racking construction for use in accommodating electronic component mounting printed circuit boards.

With the advent of large scale integrated circuit components the packing density of components in complex electronic equipment, such as telecommunications exchanges, leads to difficulties in designing the optimum racking configuration for a range of exchange sizes. Accordingly it is an object of the present invention to provide a racking construction for use in electronic equipments which is flexible and capable of accommodating a wide range of component configurations.

According to the invention there is provided an electrical equipment rack including a plurality of single modules constructed as a frame unit accommodating a number of printed circuit boards, the rack being formed by connecting together in a stack configuration a number of single modules.

Typically each module accommodates a number of printed circuit cards located vertically between runners in the bottom and top surfaces of the module. Each rack may consist of a (i) base unit, housing a blower, power supply unit and mains and power distribution system, (ii) one or more single modules accommodating printed card equipment stacked upon each other and the base unit and (iii) a cabinet top providing a ventilation exit flue. The modules are adapted to interlock and the rack is connected into a cabinet by the incorporation of similarly sectioned side panels, front panels and rear doors. Typically the cabinet components are retained in position by the use of a clip-on vertical trim which covers the interlocking front and rear edges of the modules and is adapted in a rack suite configuration to cover the abutting edges of a pair of racks.

Such an arrangement allows racks or cabinets of different sizes to be produced in accordance with the requirements of equipment provided.

The invention should be more readily understood from the following description which should be read in conjunction with the accompanying drawings. Of the drawings:—

Fig. 1 shows the basic component parts of a rack according to one embodiment of the invention whereas,

Fig. 2 shows a larger view of the eight module rack and how printed circuit cards are located in the frame modules.

A single module 1 consists of a printed circuit card frame with card edge runners such as 1A mounted on the floor and the ceiling of the module to accommodate vertically mounted printed circuit cards. (Fig. 2 at 21 shows a pcb fully located and at 22 partially withdrawn.) The rack of the embodiment of the invention is constructed by

stacking the required number of modules on top of each other and on top of a base unit 2 with a ventilation top 3 completing the construction. Fig. 1 shows a two module height configuration 2MHC a five module height configuration 5MHC and an eight module height configuration 8MHC.

Typically each single module 1 comprises a forward pcb mounting area and a rear housing shown at 11 in Fig. 2 for cabling and power supply unit location. This housing may also be used to accommodate printed circuit back wiring mother boards. The mother boards are mounted vertically but at right angles to the pcb's. The ventilation top may be used to accommodate an extractor fan. The modules are bolted together to form a rigid stack.

Each module is provided with a darvic rigid pvc sheet front panel 23 which is dust sealed and magnetically retained with a maintenance removal arrangement comprising a finger channel on its top edge. Each module also includes modular side panels 24 which are retained by a channelled clip-on front 25F and rear 25R trim. The trims may be adapted in multi-rack situations to cover the abutting sides of adjacent racks in a suite.

Not shown in any of the drawings is the provision of modular rear doors to complete the modular construction of the rack. This allows maintenance access to the rear cabling housings of each of the modules are required.

The above description has been of one embodiment only and is not intended to be limiting thereto. Alternative arrangements will readily be suggested to those skilled in the art. For example the printed circuit cards are shown in Fig. 2 as being located vertically between upper and lower runners, however, arrangements can readily be provided for horizontal card mounting if required. In certain cases the rack or cabinet may not require a base unit and may consist of a number of stacked single modules with a top. Alternative inter-connections for the modules of the stacked rack could be used.

The major features of the invention provide the following advantages:—

- (i) Small modules make for easy production
- (ii) Transport charges to site are reduced and
- (iii) Low cost construction provides a card frame and cabinet as an integral unit.

## CLAIMS

1. An electrical equipment rack including a plurality of single modules constructed as a frame unit accommodating a number of printed circuit boards, the rack being formed by connecting together in a stack configuration a number of single modules.

2. An electrical equipment cabinet comprising a base unit, housing power supply equipment, an electrical equipment rack according to Claim 1 located upon the base unit and a cabinet top incorporating a ventilation exit flue and located on the top of the rack.

3. An electrical equipment cabinet according to Claim 2 in which the component parts are bolted

together and are provided with modular side panels which are retained by a channelled clip-on front and rear trim.

4. An electrical equipment cabinet substantially as described with reference to the accompanying drawings.

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